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ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy Environmental Cleanup Program

Environmental Restoration Project
Standard Operating Procedure

for:

Field Quality Control Samples

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Revision Log

Revision No.	*Effective Date*	*Prepared By*	*Description of Changes*	*Affected Pages*
Revision 1	12/17/01	Keith Greene	Entire Document	All

Field Quality Control Samples

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Field Quality Control Samples

Note: Environmental Restoration (ER) Project personnel may produce paper copies of this procedure printed from the controlled-document electronic file located at http://erinternal.lanl.gov/home_links/Library_proc.shtml. However, it is their responsibility to ensure that they are trained and utilize the current version of this procedure. Contact the author if text is unclear.

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the requirements for the collection of field quality control (QC) samples to ensure the reliability and validity of field and laboratory data. This procedure is applicable to the preparation of ER Project sampling and analysis plans (SAPs) that include the collection of environmental samples. Field QC samples shall be collected as described in this procedure and taken to the Los Alamos National Laboratory Sample Management Office (SMO) with the regular field samples for subsequent chemical and physical testing.

2.0 SCOPE

This SOP is a mandatory document and shall be implemented by all ER Project participants when collecting field, quality-control (QC) samples to ensure the reliability and validity of field and laboratory data for the ER Project.

Note: Subcontractors performing work under the ER Project's quality program shall follow this SOP for collecting field, quality-control (QC) samples to ensure the reliability and validity of field and laboratory data for the ER Project or may use their own procedure(s) as long as the substitute meets the requirements prescribed by the ER Project Quality Management Plan, and is approved by the ER Project's Quality Program Project Leader (QPPL) before the commencement of the designated activities.

3.0 TRAINING

3.1 This procedure is a self-study. The **Field Team Leader** (FTL) is responsible for ensuring that field team members who are involved in the collection of field QC samples for the ER Project are familiar with the objectives of and properly trained on each sampling procedure to be used. In addition, all field team members must document at http://erinternal.lanl.gov/Training/Trainingmain.shtml that they read and understand this procedure in accordance with QP-2.2.

3.2 Field team members implementing this procedure should have a general knowledge of the Environmental Protection Agency (EPA) methods and protocols for sampling.

4.0 DEFINITIONS

4.1 *Aliquot* — An aliquot is a portion of a sample that is representative of the entire sample.

4.2 *Background sample* — A sample collected from an area or site similar to the one being studied, but located in an area known or thought to be free from pollutants of concern.

4.3 *Data Quality Objectives (DQOs)* – A statement of the overall level of uncertainty that a decision-maker is willing to accept in the results derived from environmental data.

4.4 *Equipment rinsate blank* — A sample of analyte-free media that has been used to rinse the sampling equipment. It is collected after completion of decontamination and prior to sampling.

4.5 *Field duplicate samples* — Independent samples that are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently.

4.6 *Quality control samples* — Samples used in a planned check of the operation of a measurement system to obtain a measure of the quality of the data generated.

4.7 *Site-Specific Health and Safety Plan (SSHASP)* — A health and safety plan that is specific to a site or ER-related field activity that has been approved by an ER health and safety representative. This document contains information specific to the project including scope of work, relevant history, descriptions of hazards by activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment [PPE]) and hazard mitigation.

4.8 *Trip blank* — A sample of analyte-free media taken to the sampling site and returned to an analytical laboratory unopened. A trip blank is used to identify contamination attributable to shipping and field handling procedures. Trip blanks are required for all field events that include the collection of samples for volatile organic compound analysis.

5.0 BACKGROUND AND PRECAUTIONS

Note: This SOP is to be used in conjunction with an approved SSHASP. Also, consult the SSHASP for information on and use of all PPE

5.1 Data quality objectives (DQOs) for the data collection activity describe the overall level of uncertainty that a decision-maker is willing to accept in the results derived from environmental data. It is imperative that the DQOs be defined in the SAP prior to the initiation of field and analytical laboratory work as required by the Installation Work Plan, Chapter 3 (LANL, March 2000). The responsible parties performing the work must be aware of the DQOs so that informed decisions during the course of the project can be made to attain those DQOs.

5.2 All proposed ER Project SAPs are reviewed and approved through the ER Project peer review process. The FTL is responsible for coordination of all field activities. These include, but are not limited too, adhering to the SAP requirements, ordering the required field paperwork (sample collection logs and chains of custody), arranging for the correct EPA analytical and/or radiological methods through the SMO, obtaining the correct bottles, labels, and coolers, arranging the field team efforts, and providing the screening results for shipment/transport requirements. The FTL is also responsible for adherence to sampling protocols mandated by all applicable EPA regulations and analytical methods as described in the SAP. When ordering field paperwork, the FTL shall ensure that the field QC sample requirements are included.

5.3 Adherence to properly documented field procedures will ensure that samples do not become contaminated through sampling activities.

5.4 All waste generated from sampling must be handled in accordance with ER-SOP-1.06.

5.5 Sampling procedures outlined in the SAPs are applied to field QC samples in the same way they are applied to regular field samples.

5.6 Field QC sample containers must be labeled and transported, and the samples analyzed, in a manner identical to all other samples taken at a site.

6.0 RESPONSIBLE PERSONNEL

6.1 Author

6.2 Field Team Leader (FTL)

6.3 Field Team (FT)

7.0 EQUIPMENT

Equipment required to implement this procedure is list on the Equipment and Supplies Checklist in ER-SOP-01.02 (Attachment B).

8.0 PROCEDURE

Note: Deviations from SOPs are made in accordance with QP-4.2.

8.1 Pre-Operation Activities

8.1.1 The requirements for field QC samples must be evaluated as part of preparation of the site-specific SAP. Field QC sample requirements are provided in Attachment A. In addition to the field QC samples listed in Attachment A, certain site-specific projects may require other types of samples be collected to obtain information concerning the sampling site (e.g., background and control samples). Determine the need for these samples during the SAP preparation activities.

8.1.2 Obtain deionized water in sealed containers appropriate for transport to the field and in sufficient quantity to prepare the required equipment rinsate blanks. Do not use tap water or drinking water purchased from a local store, as these sources typically contain trihalomethanes.

8.1.3 Trip blanks are required for all field events that include the collection of samples for volatile organic compound (VOC) analysis. Trip blanks must be prepared at the beginning of the sampling activities and stored with the regular sample containers during the entire project. Trip blanks for water sampling activities shall be prepared from deionized water that has been heated for at least 4 hours at 85 degrees C and purged with ultra-pure nitrogen (99.9%) for at least 20 minutes. The containers should be preserved, filled and sealed. Trip blanks for soil sampling activities shall be prepared using VOC-free soil or sand. See ER-SOP 1.02 for container and preservative requirements.

8.2 Procedure

8.2.1 Collect and prepare each type of QC sample required in the manner defined below. See Attachment A for the collection frequency of field QC samples that shall be addressed in the SAP.

8.2.2 Equipment Rinsate Blank

After decontaminating the field sampling equipment, rinse with deionized water and collect the rinsate for analysis. Assure that all equipment surfaces that come in contact with the sampling materials are rinsed (e.g., the inside of a bailer). The rinsate water should be collected throughout the day and the container filled all at once at the end of the day's sampling activities. (Note: do not collect the water used for decontaminating the field sampling equipment.)

8.2.3 Field Duplicate

At the frequency specified in Attachment A, collect two separate samples from the same source and at the same location and time. Place the samples in separate containers, follow the sample preservation procedure, label each as a unique sample, and submit both samples for the same analyses.

8.2.4 Trip Blank

Trip blanks must be prepared before the day's sampling events, and submitted with the regular samples at the end of each day's sampling activities (when collecting samples for VOC analysis), or at the end of the project if the required frequency is maintained. The number of trip blanks to be prepared depends upon the number and frequency of VOC samples to be collected (see Attachment A for guidance). Maintain the trip blank containers with the regular sample containers throughout the sampling event and return them to the SMO with the collected samples. ***Do not*** open the trip blanks.

9.0 REFERENCES

The following documents are cited within this procedure:

Installation Work Plan for Environmental Restoration Project, Revision 8, LANL, LA-UR-00-1336, March 2000

QP-2.2, Personnel Orientation and Training

QP-4.2, Standard Operating Procedure Development

ER-SOP-01.02, Sample Containers and Preservation

ER-SOP-01.04, Sample Control and Field Documentation

10.0 RECORDS

The Field Team Leader is responsible for submitting the following records (processed in accordance with QP-4.4) to the Records Processing Facility.

10.1 Completed Daily Activity Log forms (Attachment E in ER-SOP-01.04) or field notebook that includes

- deviations (if applicable),
- calibration information,
- a record of daily activities, and/or
- any other pertinent information.

10.2 Completed Chain-of-custody From/Request for Analysis Form (Attachment C ER-SOP-01.04).

10.3 Sample Collection Log (Attachment B in ER-SOP-01.04).

11.0 ATTACHMENTS

Attachment A: Field Quality Control Sample Requirements (1 page)

Field Quality Control Sample Requirements

QC Sample Type	Sample Matrix	Frequency	Purpose
Field duplicate	Soil Water	One per day per matrix type or 1 per 20 samples, which ever is more frequent.	To evaluate the reproducibility of the sampling technique.
Equipment rinsate blank	Deionized water used to rinse equipment	One per day or 1 per 20 samples collected, which ever is more frequent.	To evaluate decontamination procedures.
Trip blank	VOC[a]-free soil or sand; or VOC-free deionized water	One per day or 1 per 20 samples collected for VOC analysis, which ever is more frequent	To determine contamination during storage and transport.

a. VOC = Volatile organic compound

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